**Objectives**

Upon completion of this activitiy, you will:

* Understand how chemical equilibrium explains how increasing CO2 in atmosphere and increasing global temperatures can affect the acidity of the oceans.

**Causal Principles**

1. Gravitational energy, thermal energy and/or chemical **energy** drive all movement and change of matter on Earth.

2. A system is in **equilibrium** when energy in the system is balanced.

3. Matter moves and changes to return a system to **equilibrium.**

4. **Energy** is needed to break bonds and is released when bonds form.

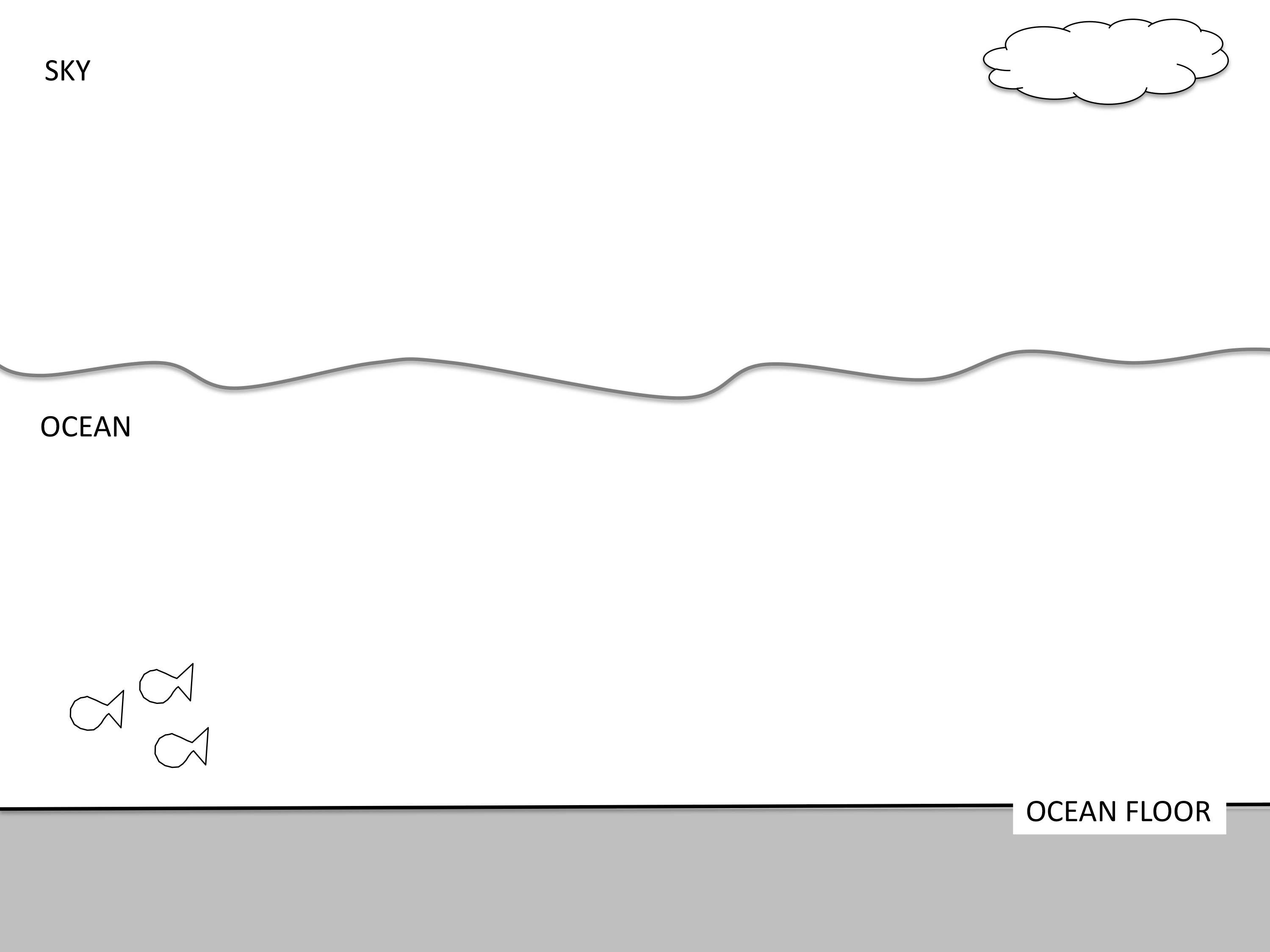
5. **Temperature** is a measure of the movement of molecules. Higher temperature means molecules are moving faster.

**PART 1: Background Notes**

**Class Notes**

On the diagram below, draw in the steps of the process of ocean acidification:

* Increased CO2 in the atmosphere
* Increased CO2 in the oceans
* Formation of hydrogen and bicarbonate ions



**Part 2: Group Work**

* What role does temperature play in ocean acidification?
* Explain all of the factors that you could change to impact the acidity of the oceans and how the acidity would change in response to that action.

**Part 3: Homework**

If you complete the group work, you may work on the homework **on your own.** This means your answers should be generally unique from other students’ answers. **Submit your homework using ANGEL**.

1. Using the concept of chemical equilibrium, explain why increasing carbon dioxide in the atmosphere may lead to increased ocean acidification.
2. Using the concept of chemical equilibrium, explain why increasing global temperature may lead to a decrease in ocean acidity.